

**AMENDMENTS TO THE CLAIMS**

1. (Currently amended) A CO<sub>2</sub> incubator for incubating a culture medium comprising:
  - a housing having an interior divided into at least two separate incubation spaces by a partition and a respective door for opening and closing entry into each of said incubation spaces;
  - CO<sub>2</sub> gas concentration detection means for detecting a CO<sub>2</sub> concentration in each of the plurality of incubation spaces,
  - air-agitating blower for agitating the air in the plurality of incubation spaces to make uniform the state of the air in each said space,
  - a measurement air sampling tube and a first multi-position valve for selectively communicating the air sampling tube with the inside of each of the incubation spaces,
  - a measurement air return tube and a second multi-position valve for selectively communicating the air return tube with the inside of the incubation spaces,
  - a pump for sucking a part of the air in the plurality of incubation spaces into the measurement air sampling tube, and returning the air to the incubation spaces through the measurement air return tube after being taken by the CO<sub>2</sub> gas concentration detection means,
  - CO<sub>2</sub> gas concentration setting means for setting a desired CO<sub>2</sub> gas concentration to be present in the incubation space,
  - CO<sub>2</sub> gas supply means and a valve apparatus for selectively supplying a CO<sub>2</sub> gas into each of the incubation spaces, and
  - a control means for controlling the CO<sub>2</sub> gas supply means that operates each of said first, second and third multi-position valves to select the gas in any incubation space, detect the CO<sub>2</sub> gas concentration of the selected gas by the CO<sub>2</sub> gas concentration detection means, and control the supply of the CO<sub>2</sub> space to each incubation space in accordance with the detected CO<sub>2</sub> gas concentration by executing an operations of proportion, proportion and integration, or proportion

and integration and differentiation on the basis of a deviation between the detected CO<sub>2</sub> gas concentration and the set CO<sub>2</sub> gas concentration value to calculate a CO<sub>2</sub> gas supply time per unit time to the incubation space and a stop time, wherein said proportion operation calculates a control amount in proportion to the deviation for reducing the deviation, said integral operation calculates a control amount for reducing an integrated value of the deviation, and said differential operation calculates a control amount for reducing a differentiated value of the deviation; and

the control means controls supply of CO<sub>2</sub>-gas concentration in the incubation space as detected by said CO<sub>2</sub>-gas concentration detection means and a set CO<sub>2</sub>-gas concentration value set by said CO<sub>2</sub>-gas concentration setting means to calculate a CO<sub>2</sub> gas supply time per unit time to the incubation space and a stop time, and to supply CO<sub>2</sub> gas to the incubation space from the CO<sub>2</sub> gas supply means in accordance with the calculated supply time and stop time.

2. (Original) The CO<sub>2</sub> incubator according to claim 1, wherein the CO<sub>2</sub> gas concentration detection means is constituted of a CO<sub>2</sub> sensor using infrared rays.

3. – 5. (Canceled)

6. (New) The CO<sub>2</sub> incubator according to claim 1, wherein a plurality of incubation spaces are disposed in the incubator and

the control means selects the gas in any incubation space, detects the CO<sub>2</sub> gas concentration of the selected gas by the CO<sub>2</sub> gas concentration detection means, and controls the supply of the CO<sub>2</sub> gas to each incubation space in accordance with the detected CO<sub>2</sub> gas concentration.